

REMARKS/ARGUMENTSCLAIM REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH

The Examiner has again rejected claims 1, 30-40, 42-64 and 66-69 under 35 U.S.C. 112, second paragraph, as being indefinite to the extent that the Examiner asserts that the claims are confusing as to intent because it is evident that other conditions, such as pressure and temperature, must be controlled in order to establish the conditions of the claims and the metes and bounds of the claims cannot be definitively determined.

Applicants respectfully disagree. Nonetheless, the claims have now been amended to recite that an effective amount of inert gas, e.g., nitrogen, air, etc., is added to one or both of the streams of reactants to increase the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric conditions by at least 1.25. Thus, the amended claims include “an effective amount” with the functional effect achieved set forth in the claim, i.e., to increase the volume of the developing foam by at least 1.25 (or other number). It is well settled law that this claim language is not indefinite. See *In re Caldwell*, 319 F.2d 254, 138 USPQ 243 (CCPA 1963); *Ex parte Dobson*, 165 USPQ 29 (BPAI) 1969).

Moreover, the claims now differentiate the recitation of expansion “instantaneously” upon exit from the mix head (i.e., frothing foam), from the expansion effected by the prior art’s foaming agents upon release from the mixers (i.e., non-frothing foam). That is, the phrase “prior to the time that any blowing agents [i.e., foaming agents in the prior art], that rely on the heat of reaction to expand can contribute to any foaming process” makes definite that there are two foaming processes occurring.

The Examiner’s assertion that “specific qualitative conditions of the immediate expansion” must be established in the claims is not understood or, to the extent understood, not well taken. The claims require an effective amount of an ingredient with the effect achieved set forth in the claim. This makes the claims definite. There is no need to provide temperature and pressure ranges in the claims since those ranges will vary depending upon the effect to be achieved, which is already set forth in the claim.

Consequently, the rejection of the claims as indefinite under 35 U.S.C. 112, second paragraph, is now moot.

CLAIM REJECTIONS UNDER 35 U.S.C. §102 AND THE §103 REJECTION OVER RAYNOR ET AL.

Claims 1, 30, 31, 34-36, 46, and 51-54 have again been rejected under 35 U.S.C. § 102(b) as being anticipated by Raynor et al. (U.S. Patent No. 3,882,052) or, in the alternative, as obvious and, therefore, unpatentable over Raynor et al. Applicants believe the claims as amended differentiate the present invention from the disclosed prior art, either individually or in any combination with other prior art.

In particular, a number of the independent claims now provide for the step of adding an effective amount of an inert gas, e.g., nitrogen, air, etc., to one or both of the streams of reactants to increase the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric conditions by at least 1.25. Thus, the claims now differentiate “frothing” or a frothed foam, from “non-frothing” or a non-frothed foam. As clearly defined in the present application, a frothed foam results from the expansion of an inert gas with a combined stream of reactants that is released to atmospheric pressure from a higher pressure instantaneously after leaving the mix head. It is different from a non-frothed foam in that a non-frothing foam waits for a heat of reaction of the chemical reaction between the isocyanate and the isocyanate-reactive component before expansion. This one or two seconds of delay provides for a less viscous flow of material out of the mixer prior to foaming, whereas a frothed foam starts foaming immediately.

Raynor emphasizes the criticality of a non-frothing polyurethane foam (Col. 1, lines 64-65; Col. 3, lines 63-68). The Examiner’s continued assertion that Raynor inherently teaches the expansion as claimed is traversed in light of the distinction now made in the claims between the expansion of an inert gas for the foaming process versus the expansion of the blowing agent or foaming agent due to the heat of reaction of the chemical reaction that takes place.

The use of nitrogen by Raynor, in any amount, as a nucleating gas, cannot inherently achieve the result of increasing the volume of the developing foam as it instantaneously leaves the mix head, under atmospheric conditions, by at least 1.25. Raynor, teaches that nitrogen or nucleating gas must be “blended” into the foam forming mixture in a manner that is different from and distinguished from conventional prior art techniques. (Col. 5, lines 17-25). That difference in technique results in the generation of a foam that avoids frothing. (Col. 5, lines 27-30). To the extent that the Examiner believes it is inherent that the any use of nitrogen will provide for the increased volume in developing foam as it instantaneously leaves the mix head, the Examiner is simply misinterpreting Raynor.

First, if it were inherent, Raynor invention could not achieve its stated goal of providing a non-frothed foam.

Second, notwithstanding his remarks that the burden is on the Applicants to demonstrate the differences in the process, the Examiner has not provided any evidence that would indicate any such understanding by one of ordinary skill in the art ; e.g. that nitrogen used by Raynor results “pre-expansion”. The Examiner’s position that Raynor provides for “no substantial pre-expansion” and therefore does not fully exclude some pre-expansion does not take into account what one of ordinary skill in the art would believe to be the case. Any person of ordinary skill in the art, when reviewing Raynor, will necessarily conclude that no pre-expansion is contemplated. Otherwise, Raynor’s invention will not work! For the Examiner to interpret “no substantial pre-expansion” as meaning that some may exist, can only be done in hindsight, by reconstructing the present invention, and by a person not of ordinary skill in the art.

In addition, in at least claim 39, Applicants have addressed the fact that an excess of isocyanate is used compared to the isocyanate-reactive component, so that a polyisocyanurate foam is produced. This language is no longer just “in the preamble.” Instead, there is now a requirement that a polyisocyanurate foam be produced. Raynor does not produce isocyanurate foams. Thus, this claim is clearly not anticipated by Raynor. Further, Raynor makes no suggestion and provides no motivation to produce a polyisocyanurate foam. Thus, this claim is believed to be non-obvious over Raynor as well. Reconsideration and withdrawal of this rejection is earnestly solicited.

Next, the Examiner has again rejected claims 34 and 51 under 35 U.S.C. § 102(b) as being anticipated by Wishneski, et al. (U.S. Patent No. 5,264,464). Applicants believe the claims as amended clearly differentiate the present invention from the disclosed prior art.

Wishneski teaches that “[a]ny polyurethane foam forming composition which is suitable for processing and dispensing by means of a portable foaming apparatus may be employed in preparing the polyurethane form in accordance with the process of the present invention.” (Col. 1, line 66 – Col. 2, Line 2). But, Wishneski does not stop there! Wishneski hinges this teaching to the proviso “provided that monochlorodifluoromethane is employed as the *sole* blowing/frothing agent.” (emphasis added, Col. 2, lines 2-3). Wishneski, like Raynor, contemplates the use of nitrogen as a nucleating gas, which cannot — inherently or otherwise — achieve the result of increasing the volume of the developing foam as it instantaneously leaves the mix head, under atmospheric conditions, by at least 1.25. Frothing cannot be inherent in this system. Any other interpretation is simply a misinterpretation. First, if inherent, Wishneski’s invention could not achieve its stated goal of providing a foam that uses monochlorodifluoromethane as the sole blowing/frothing agent. If there were any frothing caused by the nucleating agent, then Wishneski could not achieve the stated goal and there would necessarily be a second frothing agent (*i.e.*, nitrogen or nucleating gas). Within the context of Wishneski, nitrogen gas cannot be used in any manner to create a frothing foam. This is the antithesis of the present invention.

Second, to the extent that Wishneski may use a frothing agent to create a frothed foam, any frothing that occurs is imparted by monochlorodifluoromethane (or possibly, water (See Col. 5, lines 52-64)), not any nucleating gases. See Col. 1, lines 53-57 and Col. 2, lines 2-3. Thus, Wishneski does not and cannot provide an inert gas (*e.g.*, nitrogen) that, when added to one or both of the streams of reactants, increases the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric conditions by at least 1.25.

OTHER CLAIM REJECTIONS UNDER 35 U.S.C. §103

The Examiner has again rejected claims 32, 33, 37-40, 42, 47, and 64-69 under 35 U.S.C. § 103(a) as being unpatentable over Raynor as applied above and further in view of

Volkert (U.S. Patent No. 5,278,195) and Parker (U.S. Patent No. 4,024,019). The Examiner asserts that Raynor differs from the claims in that higher pressures are not specifically required by Raynor, but Raynor identifies the use of elevated pressures in practice of its mixing operations for purposes of preventing backflow of materials. The Examiner therefore concludes that it would have been obvious to practice Raynor at higher pressures for purposes of maximizing backflow reducing affects.

Applicants traverse. While elevated pressures may be used to reduce back flow, those skilled in the art would not employ pressures in excess of 1800 psi in order to prevent back flow. There is no evidence to the contrary. The Examiner's assertion that there would be expected effects and benefits arising from elevated pressures is, firstly, false, as previously stated in a prior response and, secondly, is not based upon any evidence of record, but rather on hindsight of Applicant's invention. A person of ordinary skill in the art would simply not expect the effects or benefits contemplated by the Examiner upon a fair review of Raynor.

The Examiner also notes that Raynor does not require alkane blowing agents, but nonetheless believes it would have been obvious to employ alkanes disclosed by Volkert within the teachings of Raynor. Applicants maintain that even if Raynor and Volkert were combined, they would still not give rise to the claimed invention as neither reference teaches or contemplates frothing.

The Examiner acknowledges that Raynor does not require depositing the foam to a laminator. The Examiner cites Parker as disclosing this and asserts it would have been obvious to one skilled in the art to employ the preparations of Raynor in the laminator operations provided by Parker for the purpose of providing a reinforced foam article. Again, however, Parker adds nothing to the Raynor process of foaming the composition. Thus, the combination of Raynor and Parker does not give rise to the claimed invention. Moreover, there is no evidence of record to suggest that technology known in the portable foaming art—such as Raynor and Wishneski—is transferrable to continuous foam forming technology that employs a laminator. Those skilled in the art know this is not the case. Raynor and Wishneski are specific to portable-static techniques because specific problems in that art are confronted. The same issues are not necessarily encountered in continuous-

laminator techniques, but instead a whole host of other issues must be confronted. While portable-static techniques are not out of the grasp of someone in the continuous-laminator art who is seeking to solve a problem, there must still be some suggestion to combine or some suggestion that a predictable solution exists in the portable-static art. None exists!

Claims 1 and 46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Wishneski, et al. as applied above and further in view of Raynor and Volkert. The Examiner acknowledges that Wishneski differs from the claims in that it does not require its nucleating gas to be air. The Examiner asserts that Raynor discloses air and nitrogen to be suitable nucleating gases. The Examiner therefore concludes it would have been obvious for one of ordinary skill in the art to have employed air disclosed by Raynor as a nucleating gas in practicing Wishneski.

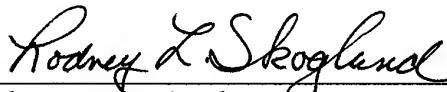
Reconsideration is respectfully requested. At issue is not whether nitrogen and air are equivalents or can be substituted for one another. The issue is whether Raynor, Wishneski, or any other reference of record, teach frothing by way of those gases. They do not. Instead, the references employ inert gases as nucleating agents and expressly limit their inventions to those that are not frothed by the nucleating agents. The record is clear on the point that inert gases can be added to foam forming processes for various purposes. In fact, Wishneski at column 7 makes this point. Namely, gases can be used as propellants and they can be used as nucleating agents. It should also be clear that inert gases—as the Applicants have discovered—can be added to either the A side or B side streams of reactants to froth the foam, prior to any foaming by processing agents that require a heat of reaction in order to expand. There should be little question that the claimed invention employs enough inert gas to achieve frothing, which Applicants maintain and one of skill in the art will understand is beyond that amount that might be used for nucleation or that might be used for a propellant and, therefore, beyond any amount taught by any reference of record. Any reliance on Volkert or Parker to overcome the teachings of Raynor or Wishneski likewise fails. Indeed, none of the reference teaches or contemplates frothing by way of an inert gas.

CONCLUSION

In view of the foregoing, Applicant maintains that the claimed invention is patentable over the prior art of record, either alone or in combination. Applicant earnestly solicits and requests a proper consideration of all evidence of record. It is respectfully requested that all pending claims are in condition for allowance. Accordingly, Applicants request early and favorable reconsideration in the form of a Notice of Allowance.

If necessary to affect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to affect a timely response. The undersigned attorney hereby authorizes the Commissioner to charge payment of any fees associated with this communication or to credit any overpayment to Deposit Account No. 06-0925.

Respectfully submitted,



Rodney L. Skoglund, Reg. No. 36,010

Arthur M. Reginelli, Reg. No. 40,139

Timothy A. Parker, Reg. No. 58,606

Renner, Kenner, Greive, Bobak, Taylor & Weber

Fourth Floor, First National Tower

Akron, Ohio 44308-1456

Telephone: (330) 376-1242

Attorney for Applicants